## Fullagar, Jill

**From:** URBANOWICZ Karla <karla.urbanowicz@state.or.us>
**Sent:** Wednesday, October 05, 2016 2:50 PM
**To:** Fullagar, Jill; MCCONAGHIE James; Labiosa, Rochelle
**Cc:** STURDEVANT Debra
**Subject:** Phone discussion for 10/13/2016
**Attachments:** OAR340_041_06212016.pdf

Hi Jill and Rochelle –
We have a phone call scheduled for Thursday 10/13/2016 from 1:30 – 3:30 to talk about updates to the Oregon assessment methodology to align assessment protocols with the frequency and duration elements in OR water quality standards. Attached is the text of OR Div 41 water quality standards and links to Table 21: Dissolved Oxygen and Intergravel Dissolved Oxygen Criteria] Toxic Criteria Tables 30, 31, and 40 if you want to refer to them for our discussion. Deb Sturdevant will not be able to join us on the call, but we will loop back with her next month.

We want to confirm our general approach, and raise a couple questions for discussion. The focus of the discussion is to clear up the toxic substance criteria implementation, but a few other questions have come up during our review regarding some of the other standards.
For reference, 2012 assessment methodology is linked at Methodology for Oregon's 2012 Water Quality Report and List of Water Quality Limited Waters (October 2014)

Topics to cover:

1) When water quality standards do not specify any metrics or duration frequency requirement, we generally use a criteria exceedance frequency of >10% of samples and a minimum of 2 exceedances, with at least 5 samples to assess a site to find impairment. This approach is applied for:
    a. Dissolved oxygen – discrete samples.
        1. Confirm consistent with standard stating "The dissolved oxygen may not be less than ..." and "the dissolved oxygen may not be less than ... as an absolute minimum"
    b. pH – samples on separate days.
        1. Confirm consistent with standard stating: "values (Hydrogen ion concentrations) may not fall outside the following ranges:...."

2) When the WQS specify criteria metrics (mean, average, etc.) calculated over a time period (30 day, 7 day, 3 months, etc.), one exceedance of metric results in a finding of impairment. The general protocols for these criteria are:
    a. The metric is calculated on a "rolling" basis. Example: A 30 day mean is calculated for each group of 30 days through the data set, such as Day 1 – Day 30, Day 2 – Day 31, etc.
    b. Data is needed for each separate day through the time period, unless otherwise specific in the standard

    This approach is applied for:
    c. Bacteria - E. coli – Criteria include mean for 30 (new rule 90) days based on at least 5 samples, AND single exceedance max 406
        1. Update after new rule approved by EPA to change to 90 days.
        2. Discuss: Is the approach in (1) consistent for applying the criteria stating "No single sample may exceed 406 E. coli..." which has been protocol for previous assessments?
    d. Bacteria – Enterococci – New criteria include geometric mean over 90 days, no more than 10% samples over maximum, and minimum of 5 sample in 90 day period
        1. Update after new rule approved by EPA

e. Bacteria – Fecal coliform – Criteria include median with not more than 10% samples exceeding maximum
    1. Confirm protocol calling for 5 samples for median and percentage calculations allowed for consistency with other bacteria metrics and general approach in (1)
    2. Discuss: Is the protocol calling for a minimum of 2 exceedances of maximum to find impairment consistent which the standard? Data set examples: 1 of 5 samples is 20%; 2 of 5 samples is 40%; 1 of 10 is 10%; 2 of 10 is 20%; 2
f. Chlorophyll a - Criteria include average over 3 consecutive months
    1. Protocol calls for at least 1 sample collected in each of 3 consecutive months
g. Dissolved oxygen – Criteria include adequate information to calculate 30-day mean minimum, 7-day minimum mean, and absolute minimum with all criteria met
    1. Updates will specify adequate data sets are hourly readings for 22 hours per day for complete 7 days and 30 day periods
h. Temperature – Criteria include 7 day average maximum
    1. Protocol calls for continuous data collected over 7 consecutive days

3) For toxic substance water standards:
    a. Human health – Duration and frequency not stated in standard.
        1. Discuss: What duration and frequency of sample results above the criteria represent impairment for assessment?
        2. Discuss: Prior assessment protocols used minimum of 2 valid samples exceeding criteria as basis for finding impairment (Other geometric or arithmetic means only for fish tissue methylmercury samples).
            1. Is there flexibility to incorporate duration and frequency elements into the listing protocols?
            2. Can the size of the sample data set be considered? For instance, different frequency for large data sets.
            3. Can weighting of newest samples or trends in data be considered particularly with extensive pollutant data sets?
    b. Aquatic life – Table 30 standard states:

" Unless otherwise noted in the table below, the acute criterion is the Criterion Maximum Concentration (CMC) applied as a one-hour average concentration, and the chronic criterion is the Criterion Continuous Concentration (CCC) applied as a 96-hour (4 days) average concentration. The CMC and CCC criteria may not be exceeded more than once every three years. Footnote A, associated with eleven pesticide pollutants in Table 30, describes the exception to the frequency and duration of the toxics criteria stated in this paragraph....."

Endnote A: Alternate Frequency and Duration for Certain Pesticides
This criterion is based on EPA recommendations issued in 1980 that were derived using guidelines that differed from EPA's 1985 Guidelines which update minimum data requirements and derivation procedures. The CMC may not be exceeded at any time and the CCC may not be exceeded based on a 24-hour average. The CMC may be applied using a one hour averaging period not to be exceeded more than once every three years, if the CMC values given in Table 30 are divided by 2 to obtain a value that is more comparable to a CMC derived using the 1985 Guidelines..."

1. Discuss: When incorporating criteria duration and frequency
    1. With only 1 sample in a day or in 4 days, does that sample represent a one-hour average and a 96-hour (4 days) average concentration?
    2. Is it correct to apply the frequency component by saying 2 or more results above any aquatic life criteria in a three year time period would indicate impairment?
    3. How is aquatic life pesticide frequency/duration implemented?

4. Can the size of the sample data set be considered? For instance, different frequency for large data sets.
5. Can weighting of newest samples or trends in data be considered particularly with extensive pollutant data sets?

4) There are no spatial aspect in any of the water quality standards, except for Intergravel Dissolved Oxygen (spatial median) and chlorophyll a (integrated over depth at one location). Therefore, duration and frequency elements of the criteria and data evaluation are applied at discrete sampling points.

Thanks for helping consider these issues.
Let me know if you have other topics to add, or would like any other background information.

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